This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

1. (Currently Amended) A detector circuit for detecting an alpha particle or cosmic ray strike in a silicon substrate having semiconductor circuits fabricated therein comprising:

a detector circuit connected to the silicon substrate to provide a detectable digital signal when the silicon substrate receives an alpha particle or cosmic ray strike;

means for generating a timing signal specifying periods of non-active operation of the semiconductor circuits, wherein the detector circuit is activated by the timing signal only when the semiconductor circuits are ~~non-inactive~~ non-active to eliminate false triggering from substrate currents flowing during normal switching operations of the semiconductor circuits.

2. (Original) The detector circuit of claim 1, wherein the timing signal is generated from a clock signal for clocking and operating the semiconductor circuits fabricated in the silicon substrate.

3. (Original) The detector circuit of claim 1, coupled to activate redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, a reload is issued of the repair data to the redundancy repair latches.

4. (Original) A detector circuit for detecting an alpha particle or cosmic ray strike of a first silicon well or a second silicon well, by differentially detecting floating voltages of the first and second silicon wells during periods of non-operation of circuits fabricated in the first and second silicon wells, comprising:

a sense amp, including a latch circuit therein, connected to each of the first and second wells;

means for generating an early timing signal before a period of normal operation of the circuits defined in the first and second silicon wells, wherein the early timing signal turns on the sense amp and disconnects the sense amp from the first and second silicon wells, to

capture the floating voltages of the first and second silicon wells in the sense amp at that point in time, and a differential sensing circuit within the sense amp amplifies and rectifies any voltage differential between the captured floating voltages of the first and second silicon wells.

5. (Original) The detector circuit of claim 4, coupled to activate redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, a reload is issued of the repair data to the redundancy repair latches.

6. (Original) A detector circuit for detecting an alpha particle or cosmic ray strike of a first silicon well or a second well, by differentially detecting floating voltages of the first and second silicon wells during periods of non-operation of circuits fabricated in the first and second silicon wells, comprising:

first and second sense amps, each including a latch circuit therein, connected to each of the first and second silicon wells;

means for generating an early timing signal before a period of normal operation of the circuits defined in the first and second silicon wells, wherein the early timing signal turns on the first and second sense amps and disconnects the first and second sense amps from the first and second silicon wells to capture the floating voltages of the first and second silicon wells in each of the first and second sense amps at that point in time, and a differential sensing circuit within each sense amp amplifies and rectifies any voltage differential between the captured floating voltages of the first and second silicon wells.

7. (Original) The detector circuit of claim 6, wherein the first and second sense amps have a built in asymmetry, to establish a preferential set of the latches in the first and second sense amps, such that for equal input floating voltages from the first and second wells, the asymmetry results in a first specified output condition, and if the first well incurred a strike, resulting in a slightly higher floating voltage in the first well than in the second well, then the first and second sense amps produce a second specified output condition indicating a strike in the first well, and if the second well incurred a strike, resulting in a slightly higher floating

voltage in the second well than in the first well, then the first and second sense amps produce a third specified output condition indicating a strike in the second well.

8. (Original) The detector circuit of claim 6, coupled to activate redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, a reload is issued of the repair data to the redundancy repair latches.

9. (Original) A detector circuit for monitoring a single silicon well in a silicon substrate for an alpha particle or cosmic ray strike by monitoring a background voltage level of the silicon well over consecutive periods of time, wherein the silicon well voltage Vwell over a first sampling period of time is compared with the silicon well voltage Vwell over a second sampling period of time to detect a deviation in the silicon well voltage which is indicative of a strike, to take a correlated double sampling of the background voltage level of the Vwell node voltage while allowing cancellation of base leakage current and noise current injection of the silicon well voltage Vwell.

10. (Original) The detector circuit of claim 9, wherein:

the sampled well node voltage Vwell is input to a first device coupled between Vwell and ground and controlled by a first clock signal CK1;

the sampled well node voltage Vwell is also coupled through a second device, controlled by a second clock CK2, to a positive input of a differential amplifier;

the connection between the second device and the differential amplifier is coupled through a capacitor and a fourth device, controlled by the second clock CK2, to ground;

a third device, controlled by a third clock CK3, is coupled in parallel to the second device and the capacitor, between the sampled well node voltage Vwell and the connection between the capacitor and the fourth device;

a reference circuit for producing a reference voltage is applied to a negative input of the differential amplifier.

11. (Original) The detector circuit of claim 10, wherein the reference voltage is produced by a reference circuit comprised of series connected voltage divider fifth and sixth devices, with a voltage divider output therebetween which produces the reference voltage.

12. (Original) The detector circuit of claim 10, wherein:

during a first clock phase, the clocks CK, CK1 and CK2 go high and the first, second and fourth devices are turned on, which resets the Vwell node to ground and discharges the capacitor to ground;

during a second clock phase, the clock CK1 goes low and the clock CK2 remains high, and the capacitor charges to the potential of the Vwell node, sensing a background voltage level of the silicon well;

during a third clock phase, the clock CK2 goes low and the clock CK3 goes high, the voltage across the capacitor is reversed, and the voltage charged during the second clock phase is subtracted from the voltage seen on the Vwell node during the third clock phase, and if a strike is observed in the Vwell node, this injected charge will raise the voltage beyond the background voltage stored on the capacitor during the second phase, and if it exceeds the threshold voltage the comparator will go high to indicate a strike.

13. (Original) The detector circuit of claim 9, coupled to activate redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, a reload is issued of the repair data to the redundancy repair latches.

14. (Currently Amended) A method for detecting an alpha particle or cosmic ray strike in a silicon substrate having semiconductor circuits fabricated therein comprising:

connecting a detector circuit to the silicon substrate to provide a detectable digital signal when the silicon substrate receives an alpha particle or cosmic ray strike;

generating a timing signal specifying periods of non-active operation of the semiconductor circuits; and

activating the detector circuit by the timing signal only when the semiconductor circuits are ~~non-inactive~~ non-active to eliminate false triggering from substrate currents flowing during normal switching operations of the semiconductor circuits.

15. (Original) The method of claim 14, including generating the timing signal from a clock signal for clocking and operating the semiconductor circuits fabricated in the silicon substrate.

16. (Original) The method of claim 14, for redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, including the step of issuing a reload of the repair data to the redundancy repair latches.

17. (Original) A method for detecting an alpha particle or cosmic ray strike of a first silicon well or a second silicon well by differentially detecting floating voltages of the first and second silicon wells during periods of non-operation of circuits fabricated in the first and second silicon wells by:

connecting a sense amp, including a latch circuit therein, to each of the first and second wells;

generating an early timing signal before a period of normal operation of the circuits defined in the first and second silicon wells, wherein the early timing signal turns on the sense amp and disconnects the sense amp from the first and second silicon wells, to capture the floating voltages of the first and second silicon wells in the sense amp at that point in time, and the sense amp amplifies and rectifies any voltage differential between the captured floating voltages of the first and second silicon wells.

18. (Original) The method of claim 17, for redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, including the step of issuing a reload of the repair data to the redundancy repair latches.

19. (Original) A method for detecting an alpha particle or cosmic ray strike of a first silicon well or a second well by differentially detecting floating voltages of the first and second silicon wells during periods of non-operation of circuits fabricated in the first and second silicon wells by:

connecting first and second sense amps, each including a latch circuit therein, to each of the first and second silicon wells;

generating an early timing signal before a period of normal operation of the circuits defined in the first and second silicon wells, wherein the early timing signal turns on the first and second sense amps and disconnects the first and second sense amps from the first and second silicon wells to capture the floating voltages of the first and second silicon wells in each of the first and second sense amps at that point in time, and each sense amp amplifies and rectifies any voltage differential between the captured floating voltages of the first and second silicon wells.

20. (Original) The method of claim 19, including designing the first and second sense amps with a built in asymmetry, to establish a preferential set of the latches in the first and second sense amps, such that for equal input floating voltages from the first and second wells, the asymmetry results in a first specified output condition, and if the first well incurred a strike, resulting in a slightly higher floating voltage in the first well than in the second well, then the first and second sense amps produce a second specified output condition indicating a strike in the first well, and if the second well incurred a strike, resulting in a slightly higher floating voltage in the second well than in the first well, then the first and second sense amps produce a third specified output condition indicating a strike in the second well.

21. (Original) The method of claim 19, for redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, including the step of issuing a reload of the repair data to the redundancy repair latches.

22. (Original) A method for monitoring a single silicon well in a silicon substrate for an alpha particle or cosmic ray strike by monitoring a background voltage level of the silicon well over

consecutive periods of time, by comparing the silicon well voltage Vwell over a first sampling period of time with the silicon well voltage Vwell over a second sampling period of time to detect a deviation in the silicon well voltage which is indicative of a strike, to take a correlated double sampling of the background voltage level of the Vwell node voltage while allowing cancellation of base leakage current and noise current injection of the silicon well voltage Vwell.

23. (Original) The method of claim 22, for redundancy repair latches in a SRAM, wherein when the detector circuit detects an alpha particle or cosmic ray strike of the redundancy repair latches, including the step of issuing a reload of the repair data to the redundancy repair latches.

24. (Original) In an integrated circuit, a detector circuit for detecting alpha or cosmic ray strikes, the detector circuit comprising:

a first area of the integrated circuit;

a monitoring circuit for monitoring a flow of current in the first area and indicating when the current is outside of a predefined range.